

alternate, the secondary are trichotomous, each forklet bearing three pedicellated flowers at its apex; the pedicles are 1 line long, and the flower expanded 3–4 lines diameter. The drupe is $1\frac{1}{4}$ inch long, 9 lines diameter; the putamen is ligneous, its sides being 2 lines thick, its cell 5 lines in diameter, with the false septum, 1 line in thickness, reaching to the axis of the cell; the testa measures 5 lines across, and the tegmen 3 lines, both plicated in a horse-shoe form round the false septum. In the fruit I examined, the embryo was not perfected*.

2. *Bursinopetalum macrophyllum*, Thw. in Hook. Kew Journ. Bot. vii. 242; Enum. Pl. Zeyl. 43;—ramulis strictis, subangulatis, opacis, fuscis; foliis ovato-oblongis, imo subacutis, et in petiolium subdecurrentibus, apice rotundato-obtusis, marginibus valde revolutis, subcoriaceis, supra fuscis, convexis, nervis invicem 7–8 venisque reticulatis utrinque prominulis, subtus subpallidis; petiolo costaque latiusculis, superne planis; corymbo terminali.—Ceylon, v. s. in herb. meo; Ramboddi, 5000 ped. altit. (Gardner, 100).

This† appears, by comparison with the foregoing, to be a very distinct species, as their characters respectively show. The leaves are $3\frac{1}{2}$ –4 inches long, 2 – $2\frac{1}{4}$ inches broad, on a petiole of 9 lines long and 2 lines broad. The fruit is of the same form, size, and structure as in the preceding species.

3. *Bursinopetalum tetrandrum*, Thwaites, Enum. Pl. Zeyl. i. 42.—Ceylon.

I saw long since, in Sir Wm. Hooker's herbarium, a plant collected in Malacca by Griffith, which in its habit and floral structure agrees with *Bursinopetalum*. Although its flowers are tetrandrous, I hardly think it will be found identical with the Ceylon plant.

XXVI.—On some new Species of *Acephalous Mollusca* from the Sea of Japan. By ARTHUR ADAMS, F.L.S. &c.

GENUS CORBULA, Bruguière.

Corbula amplexa, A. Adams.

C. testa transversim ovata, subtrigonalis, valde inæquali, sæpe epidermide tenui fusca induta; valva dextra valvam sinistram amplectente, tenui, alba, concentricè striata, ad marginem ventralem

* Structural details of this species will be shown in the 'Contributions, vol. ii. pl. 73.

† A figure of this plant and section of its fruit will be given in the same work, pl. 73.

radiatim sulcata, postice producta acuminata et utrinque angulata, latere antico rotundato ; margine ventrali postice sinuoso.

Hab. Mud-banks, estuary of the Peh-tang-ho (Lieut. Bullock).

Genus VERTICORDIA, Searles Wood.

1. *Verticordia japonica*, A. Adams.

V. testa suborbiculari, cordiformi, convexa, inæquilaterali, sub lente granulosa, radiatim valde costata, costis multis subdistantibus ; incurvatis compressis ; marginibus acutis denticulatis ; margine ventrali valde dentato.

Hab. Gotto Islands (71 fathoms), where it lives in clean fine sand, particles of which usually adhere to the shell.

The labial palps are small. The mantle is closed, with the exception of a moderate elliptic aperture in front for the passage of the foot ; the edges are thickened and furbelowed, wide apart on each side in front, approximate in the middle, where the mantle is closed and extended, and continued posteriorly, forming a common circular fringed opening, within which are the sessile siphonal orifices close together, the branchial larger than the anal. The foot is small, triangular, and compressed.

It has no relation, therefore, with *Trigonia*, the mantle of which is entirely open, and the foot large, long, and geniculate ; on the contrary, its position, judging both from the nature of the animal and the form of the shell, would seem to be in the family Bucardiidæ, the animal differing from *Bucardia* (*Isocardia*) *cor* in the posterior opening being fringed.

The shell is very similar in form to the fossil *V. granulata* of M. Seguenza, from Sicily. It is quite different from *V. novemcostata*, Adams and Reeve, from the China Sea, and is the largest of the recent species.

2. *Verticordia multicosata*, A. Adams.

V. testa suborbiculari, inæquilaterali, cordiformi, subcompressa, sub lente granulosa, pallide fusca aut sordide alba, radiatim costata, costis numerosis confertis ; marginibus subrotundatis, simplicibus ; margine ventrali obsolete dentato.

Hab. Gotto Islands ; 71 fathoms.

This species, single valves of which only were obtained, is distinguished from *V. japonica* by its compressed form and numerous close-set ribs.

Genus ERVILIA, Turton.

Ervilia japonica, A. Adams.

E. testa æquivalvi, transversim oblonga, inæquilaterali, clausa, latere

antico brevior rotundato, postico longiore producto subattenuato; alba, macula rufa elongata ad umbones ornata; superficie valvarum concentricè sulcata, sulcis regularibus confertis, area laterali postica lineis vix elevatis radiantibus instructa.

Hab. Tsu-Sima; 17 fathoms.

The conspicuous red elongate mark extending from the beaks on the anterior side of the valves will always serve to distinguish this species.

Genus TELLIMYA, BROWN.

Tellimya japonica, A. Adams.

T. testa transversim oblonga, inæquilaterali, umbonibus acutis prominulis, latere antico brevior subtruncato, postico longiore rotundato, superficie valvarum tenuissime concentricè striata, striis confertis; alba, tenui, vix opaca.

Hab. Mino-Sima; 63 fathoms.

This species is more transversely oblong than *T. bidentata* from the seas of Europe, and the anterior side is much shorter.

Genus MYRTEA, Turton.

1. *Myrtea gibba*, A. Adams.

M. testa suborbiculari, solida, opaca, sordide alba, tumida, radiatim costata, costis subgranulosis distantibus, interstitiis valde punctatis; area laterali antica costis validioribus; margine ventrali sinuoso.

Hab. Tsu-Sima; 25 fathoms.

Very gibbose, with the interstices between the ribs coarsely punctate.

2. *Myrtea reticulata*, A. Adams.

M. testa orbiculari, gibbosa, solida, alba, opaca, costellis radiantibus subgranulosis et liris elevatis concentricis valde reticulata, costellis ad latera validioribus, in medio interdum subobsoletis.

Hab. Port Hamilton; 7 fathoms: Mino-Sima; 63 fathoms.

Gibbose and strongly reticulate, with granular radiating riblets and concentric ridges.

3. *Myrtea fimbriatula*, A. Adams.

M. testa suborbiculari, gibbosula, tenui, albida, antice valde sinuata, postice flexuosa, radiatim plicata, concentricè lamellata, lamellis tenuibus subdistantibus fimbriatulis, plicis ad latera validioribus.

Hab. Tabu-Sima; 25 fathoms.

The chief character consists in the thin, wide-apart, fimbriate lamellæ.

4. *Myrtea lamellata*, A. Adams.

M. testa transversim oblonga, subcompressa, tenui, sordide alba, latere postico declinato, antico sinuoso, concentrice lamellata, lamellis tenuibus regularibus confertis crenellatis.

Hab. Tsu-Sima; 26 fathoms.

5. *Myrtea plicatula*, A. Adams.

M. testa transversim oblonga, compressiuscula, tenui, semipellucida, alba, radiatim plicata, plicis regularibus et lineolis lamellosis tenuibus concentricis subdistantibus decussata, latere antico superne elevato et dilatato.

Hab. Tsu-Sima; 26 fathoms: Mino-Sima; 63 fathoms.

Thin, plicate, with distant elevated lines, and the front upper margin dilated.

6. *Myrtea obesula*, A. Adams.

M. testa transversim oblonga, alba, gibbosa, solida, lunula rufo tincta, radiatim costata, costis validis granulosis divergentibus, in medio subobsoletis, concentrice lirata, liris validis confertis regularibus.

Hab. Tabu-Sima; 25 fathoms.

Very gibbose, transversely oblong, strongly ribbed and granular.

7. *Myrtea decussata*, A. Adams.

M. testa suborbiculari, subcompressa, sordide alba, opaca, tota radiatim costellata, costellis confertis lævibus, concentrice lirata, liris undulatis lævibus elevatis.

Hab. Tabu-Sima; 25 fathoms.

Entirely finely decussated by radiating riblets and concentric elevated lines.

8. *Myrtea circinata*, A. Adams.

M. testa orbiculari, alba, tenui, compressa, latere antico valde sinuato, latere postico flexuoso, concentrice lamellata, lamellis crassis regularibus confertis utrinque validioribus.

Hab. Mino-Sima; 63 fathoms.

A *Dosinia*-like species, with regular concentric lamellæ.

9. *Myrtea delicatula*, A. Adams.

M. testa transversim oblonga, obliqua, subcompressa, tenui, semi-opaca, alba, utrinque rotundata, radiatim plicata, plicis rugulosis, in medio evanidis.

Hab. Korea Strait; 46 fathoms.

A thin, white, obscurely plicate species.

GENUS *CRYPTODON*, Turton.1. *Cryptodon japonicus*, A. Adams.

C. testa oblonga, longiore quam latiore, alba, tenui, semiopaca, latere antico excavato, lunula impressa distincta, latere postico longitudinaliter plicato, margine valde sinuato; concentricè creberrime striata.

Hab. Okosiri; 35 fathoms.

2. *Cryptodon Manchuricus*, A. Adams.

C. testa quadrato-orbiculari, pallide fusca, ferrugineo tincta, semipellucida, concentricè striata, latere antico subdilatato, postico flexuoso.

Hab. Coast of Manchuria; 20 fathoms.

3. *Cryptodon oblongus*, A. Adams.

C. testa oblonga, longiore quam latiore, alba, tenui, subpellucida, latere antico declinato rotundato, lunula inconspicua, latere postico plicato; margine sinuoso.

Hab. Mino-Sima; 63 fathoms.

4. *Cryptodon plicatus*, A. Adams.

C. testa quadrato-orbiculari, alba, tenui, semipellucida, latere antico rotundato excavato lunula inconspicua obsoleta, latere postico valde plicato; margine sinuoso; superficie valvarum concentricè striata.

Hab. Mino-Sima; 63 fathoms.

5. *Cryptodon sulcatus*, A. Adams.

C. testa trigonali-orbiculari, sordide alba, subcompressa, ferrugineo tincta, solidiuscula, concentricè sulcata, sulcis antice incrassatis productis, latere antico rotundato, postico flexuoso.

Hab. Coast of Manchuria; 35 fathoms.

6. *Cryptodon (Clausina) subquadratus*, A. Adams.

C. testa quadrato-orbiculari, tumidula, pallide cornea, concentricè sulcata, latere antico subtruncato, postico rotundato; margine ventrali rectiusculo.

Hab. Coast of Manchuria; 20 fathoms.

Wants the posterior plicature of *Cryptodon*; subquadrata, concentrically grooved.

7. *Cryptodon (Clausina) suborbicularis*, A. Adams.

C. testa suborbiculari, ventricosa, tenui, albida, cornea, concentricè striata, latere antico producto rotundato, postico rotundato; margine ventrali arcuato.

Hab. Amiva Bay; 17 fathoms.

Has the posterior fold of *Cryptodon* proper; is small, suborbicular, concentrically striate.

Genus LEPTON, Turton.

Lepton japonicum, A. Adams.

L. testa orbiculari subæquilaterali, compressa, tenui, sordide alba, superficie concentrice striata, area antica obtusim subangulata, utrinque rotundata; margine ventrali regulariter arcuato.

Hab. Tabu-Sima; 25 fathoms.

The surface of the valves is concentrically striated, and not shagreened as in some species.

Genus GALEOMNIA, Turton.

Galeomnia japonica, A. Adams.

G. testa tenui, transversim ovata, subæquilaterali, alba, radiatim tota striata striis elevatis confertis, concentrice substriata striis concentricis irregularibus, umbonibus medianis acutis; margine ventrali arcuato.

Hab. Mino-Sima; 63 fathoms.

The ventral margin is but very slightly gaping, and the surface of the valves is radiately striated.

Genus CRENELLA, Brown.

1. *Crenella spectabilis*, A. Adams.

C. testa oblongo-orbiculari, tumida, alba, tenui, striis elevatis confertis radiantibus tota striata; margine cardinali antice crenulato, postice lamella infra-marginali instructo; latere antico rotundato, postico subangulato; superficie lineis incrementi concentrice impressa.

Hab. Mino-Sima; 63 fathoms.

This, I suspect, is the largest species hitherto described. It is a delicate, thin, white shell, entirely striated from the beak in a radiating manner, with fine elevated lines; its greatest diameter is from the beak to the ventral margin.

2. *Crenella decorata*, A. Adams.

C. testa transversim oblonga, tumida, obliqua, latere antico brevior, postico longiore rotundato, striis radiantibus et concentricis decussata, lutescente, fasciis rufo-fuscis radiatim picta; margine ventrali crenulato.

Hab. Port Hamilton; 7 fathoms.

This is a prettily marked, transversely oblong, tumid species, considerably larger than *C. decussata*, Ment.; the radiating red-brown bands are narrow at the beak, and gradually widen as they approach the ventral margin.

3. *Crenella cornea*, A. Adams.

C. testa oblonga, obliqua, tumida, subpellucida, cornea, tota radiatim striata, striis elevatis confertis, lineis incrementi concentricis instructa; latere antico brevior rotundato, postico longiore subangulato; margine ventrali crenulato.

Hab. Korea Strait; 46 fathoms.

A thin, horn-coloured, semipellucid species, entirely radiately striated, and of an oblong form, with the greatest diameter from the beak to the ventral margin.

4. *Crenella sculptilis*, A. Adams.

C. testa oblonga, crassiuscula, albida, lineis concentricis validis instructa, radiatim costellata, costellis planis lævibus, interstitiis granulis moniliformibus concinne sculptis; marginibus ventrali et cardinali crenulatis.

Hab. Chosan Harbour; 6 fathoms.

The beak in this prettily sculptured species is nearly terminal, and the shell is ovate-oblong, the greatest diameter being from the umbo to the ventral margin.

5. *Crenella crocea*, A. Adams.

C. testa transversim oblonga, obliqua, subrhomboidea, nitida, cornea, sulculis radiantibus confertis lineisque elevatis concentricis tota decussata; latere antico brevior, postico longiore rotundato; marginibus cardinali et ventrali regulariter crenulatis.

Hab. Tsu-Sima; 30 fathoms.

A radiately sulcate and decussate, shining, saffron-coloured species, with the entire margin, cardinal and ventral, conspicuously crenate.

6. *Crenella casta*, A. Adams.

C. testa oblonga, obliqua, tumida, lactea, nitida, radiatim striata, lineis incrementi concentricis impressa, fasciis duabus pallide carneolis ornata; margine valvarum crenulato; intus vivide margaritacea.

Hab. Mino-Sima; 63 fathoms.

A very beautiful, shining, milk-white species, finely radiated throughout, and adorned with two crescentic pinkish bands.

GENUS MODIOLARIA, Beck.

Modiolaria pusio, A. Adams.

M. testa transversim oblonga, obliqua, parva, tenui, fusca, latere antico brevior, postico rotundato, costellis radiantibus utrinque

ornata, costellis in medio nullis, lineolis concentricis incrementi striolata; margine ventrali crenulato.

Hab. Mino-Sima; 63 fathoms.

A small species, very nearly similar in form to *Crenella*, but with the middle of the valves plain.

Nagasaki, July 10, 1861.

XXVII.—*On Vision in the Arthropoda*. By Dr. H. Dor*.

COMPOUND eyes occur in nearly all Crustacea, in all winged and some apterous insects, and even in the aquatic larvæ of the Neuroptera, and in the larvæ of the Hemiptera. They are two in number, and form a segment of a sphere; and each is composed of an agglomeration of more simple organs, of which the number varies almost infinitely (from 50 to 25,000 in a single eye). The facets formed by the single eyes resemble the cells of a honeycomb: they are usually hexagonal, but sometimes pentagonal, rectangular, or irregular; and these various forms may be met with in the same eye.

On making an antero-posterior section of the eye, each facet is found to correspond with a more or less lenticular organ, exactly resembling in some species the crystalline lens of the Vertebrata. This has been called the *cornea*. Behind it is the *crystalline body*, a transparent and strongly refractive cone, enclosed in a cupuliform envelope, which is also transparent and is perfectly continuous with the nervous fibre. The union of all the nervous fibres, which in their course almost constantly present a dilatation and afterwards traverse several masses of ganglionic cells, forms the optic ganglion. The spaces between the different nervous fibres are filled up with a dark pigment.

The author gives a summary of the different views put forward by writers on the mechanism of vision in the Arthropoda. Cuvier supposed that the nervous filaments, although each corresponding to a facet, lost themselves in the layer of pigment; and he found it difficult to understand how impressions could be produced upon them through this opaque matter. Marcel de Serres did not recognize the conical crystalline bodies, the discovery of which is due to Treviranus (*Verm. Schriften*, iii. p. 152), who, however, did not perceive their importance. According to him, the compound eyes act like a convex mirror, upon which objects are reproduced enlarged, the entire cornea reflecting images of distant objects, and each facet those of neighbouring objects.

* Abstract from the 'Bibliothèque Universelle,' 1861, "Archives des Sciences Physiques et Naturelles," p. 328.